Printed Pages : 3

EEC069B

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 121854

Roll No.

B. Tech.

(SEM. VIII) THEORY EXAMINATION, 2014-15

SATELLITE COMMUNICATION

Time : 2 Hours] [Total Marks : 60

NOTE : (1) Attempt all questions.
(2) All question carry equal marks.

1 Attempt any four parts of the following : 4×5=20

(a) Explain Kepler's law of planetary motion. How are these applied to the case of geostationary satellite?

(b) The apogee and perigee of an elliptical satellite orbits are 3000Km and 200Km. Determine the eccentricity, semi-major axis and semi-minor axis.

(c) The orbital period of a satellite is 650 min. determine the semi-major axis of the elliptical orbit.

(d) Explain what is meant by geostationary orbit. How do the geostationary orbit and geosynchronous orbit differ ?

(e) What is advantage of satellite communication over optical fiber communication?

(f) The two satellite are moving in different elliptical orbit with the same perigee but different apogee distance the semi-major axis of two orbits are 16000Km and 24000Km. Determine the orbital period of a satellite 2 if the orbital period of satellite 1 is 600 min.

2 Attempt any four parts of the following : **4×5=20**

(a) Explain how a satellite is placed into a geostationary orbit?

(b) Explain why downlink frequency should be lower than uplink frequency?

(c) Draw the block diagram of satellite communication system. Explain each part of them.

(d) What is earth sensor and sun sensor?

(e) Explain the need of Attitude and orbit control in satellite?

(f) Determine the average angular velocity of a satellite moving in an elliptical orbit. If the semi-major axis is 42164.8 km and orbital eccentricity is 0.0011 given that $G=6.67 \times 10^{-11}$ and $M = 5.98 \times 10^{28}$.

3 Attempt any two parts of the following : **2×10=20**

(a) What is look angle? Explain in detail azimuth angle and elevation angle.

(b) Draw the block diagram of satellite subsystem. Explain power supply system.

(c) An earth station situated in the dockland of London England needs to calculate the look angle to a geostationary satellite in Indian Ocean operated by Intelsat. The details of earth station site and satellite are as follows: Earth station latitude and longitude are 52.0° and 0° and satellite longitude longitude (subsatellite point) is 66.0°E.